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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,227	03/25/2005	Steven J Harris	540-560	2005

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EXAMINER	
TURK, NEIL N	

ART UNIT	PAPER NUMBER
1743	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/529,227	HARRIS ET AL.	
	Examiner	Art Unit	
	Neil Turk	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9/22/05.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ansuini (4,780,664). Ansuini discloses a corrosion sensor that is fabricated with a thin steel foil bonded to a thin backing to produce a laminate. Ansuini also discloses that the foil has two foil electrodes of equal area and each has a broad, flat plate at each end, and that each pair of plates are placed adjacent and with a small gap between each other. Ansuini also discloses that the plates of the electrode are connected together by a thin section, and the thin sections are serpentined (lines 3-25, col. 3). Ansuini shows in figure 2 a sensor 50 with two electrodes 60, 80 on a substrate 51. Ansuini shows the first plate 64 is connected to a long, thin, serpentine section or choke point 66. Ansuini further discloses that the choke point 66 is connected to a second flat plate 68, which has a second terminal 70. Ansuini discloses that the second electrode 80 is similar to the above configuration (lines 51-68, col. 4; lines 1-9, col. 5; fig. 2). Ansuini shows in figure 1 a simplified diagram of the sensor, which includes a sensing circuit 12 with two electrodes 16, 18 each having a pair of electrical terminals (lines 7-50, col.4, fig. 1). Ansuini also discloses that the plates are adjacent to each other with a small uniform

gap (fig. 2, characters 92, 94) between them (lines 18-26, col. 3; lines 4-9, col. 5). Ansuini also discloses a method for determining a time averaged corrosion rate, known as the electrical resistance ("ER") method. Ansuini discloses that the sensor comprises a long strip of metal, which is exposed to the environment that is being tested, and corrosion reduces the dimensions of the exposed strip, thus changing the electrical resistance of the strip. Ansuini discloses that the increase in resistance is converted into a time averaged corrosion rate, which is also a cumulative measurement (lines 33-47, col. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ansuini in view of Kordecki (EP0932037 A2). Ansuini has been discussed above.

Ansuini does not disclose a reference sensor that provides a measurable variation in resistivity in response to changes in temperature, which takes the same form as the resistivity sensor and is arranged in an overlapping manner to the resistivity sensor. Kordecki discloses that conventional corrosion sensors include a temperature reference in conjunction with the sensor for performing temperature correction of any changes in the measured resistance, and that these sensors often come in the arrangement of a Wheatstone bridge or Kelvin bridge (paragraphs 0003-0004). It would have been obvious to modify the Ansuini device to include a reference sensor in the corrosion sensor device to provide a measurable variation in resistivity in response to temperatures changes such as taught by Kordecki in order to avoid improper readings of corrosiveness.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ansuini in view of Agarwala (5,338,432). Ansuini has been discussed above. Ansuini does not disclose a galvanic sensor with at least one corrosive track made of a first metallic material and a thin film track made of a second, different, metallic material. Ansuini also does not disclose corrosive tracks with further tracks arranged in an interdigitated pattern. Agarwala discloses corrosivity sensors, which have conductive elements 16a and 16b with strips 24a and 24b, as shown in fig. 1a-b. Agarwala also discloses that the conductive elements 16a and 16b may be of dissimilar metals so that one element may act as an anode and the other as an anode so that the presence of an electrolyte will generate galvanic current (lines 53-63, col. 3; lines 4-11, col. 4). Agarwala also discloses that the magnitude of the galvanic current will be indicative of

the corrosivity of the electrolyte or environment (lines 56-58, col. 3). Agarwala also discloses that the strips 24a and 24b of elements 16a and 16b are interdigitated so that the strips alternate between those of one conductive element and those of the other, and the strips 24a and 24b may form any interdigitated pattern (lines 12-22, col. 3). It would have been obvious to modify the Ansuini device to include a galvanic sensor and an interdigitated pattern of corrosive tracks such as taught by Agarwala in order to provide another means for determining the corrosivity of the electrolyte or environment and two form a pattern such that conducive elements and those of the other alternate in the apparatus.

Claims 13-15, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ansuini in view of Glass (5,437,773). Ansuini has been discussed above. Ansuini does not disclose a platinum resistance thermometer for measuring a temperature where the microsensor is mounted. Ansuini also does not disclose that the corrosive tracks are made of a metallic alloy or an aluminum alloy. Ansuini does not disclose sputtering as the means for depositing the thin film onto the substrate. Glass discloses a method for monitoring corrosion that includes a resistance-temperature detector (RTD), which typically would be a platinum thin film or line of any dimension. Glass discloses that the RTD will be used for temperature correction and will be incorporated as part of the array (lines 21-35, col. 12). Glass also discloses that as illustrated in fig. 2, aluminum alloys such as 2024 and 7075 are used as corrosion potential rate sensors 15 and 16 (lines 11-32, col. 5). Glass also discloses that the corrosion monitor apparatus may be applied to an aircraft (lines 24-28, col. 5). Glass

also discloses that sputtering is used for deposition of the sensor materials (lines 40-42, col. 9). It would have been obvious to modify the Ansuini device to include a platinum resistance thermometer and aluminum alloy sensor elements with additional application to an aircraft and sputtering means for depositing the thin film such as taught by Glass in order to provide a properly deposited film and temperature correction means for measurements indicating changing conditions and a proper material for determining corrosion rates in changing environments, such as on aircrafts.

Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ansuini in view of Glass and in further view of Kordecki (EP0932937 A2). Ansuini has been discussed above. Ansuini/Glass do not disclose that the apparatus comprises a metallic alloy that shares a metal with the alloy of the track. Ansuini/Glass also do not disclose a second metallic component composed of a metallic alloy and a second metallic microsensor with a metallic alloy track. Ansuini/Glass also do not disclose that the proportion of the alloying constituent in the track alloy is similar to the alloying constituent of the bulk alloy to within 3% or to within 1% of the total constituents of the bulk alloy. Kordecki discloses a multi-purpose sensor with a conductive sensing element. Kordecki also discloses that the conductive sensing element may be formed from alloys of palladium or lead, palladium-gold, lead-bismuth, or lead-palladium. Kordecki also discloses an abrasion sensor 100 which includes a substrate 110, contact pads 120 and 130, and a conductor 140 (paragraph 0015, fig. 1). Kordecki also discloses that the conductor 140 is made from a bimetallic alloy of 1% to 99% palladium or a bimetallic alloy of 1% to 99% lead and is arranged on a substrate to form sensing

element 160 (paragraph 0022-0023). Kordecki also discloses that the abrasion sensor is suitably made from a palladium-gold alloy of 5% to 95% palladium and a complementary percent of gold; the composition of the palladium-gold alloy of the abrasion sensor may be adjusted with its conductor 140 to meet custom criteria (paragraph 0022). Kordecki discloses that such bimetallic alloys will posses the highest resistivity and lowest TCR (Temperature Coefficient of Resistivity) that can be attained for the given alloy (paragraph 0022). Kordecki also disclose a corrosion sensor 200 and its corresponding conductor 240, and the above discussion on the abrasion sensor and its corresponding conductor is applicable except for in the chosen materials of construction (paragraphs 0024-0025). Kordecki discloses that the conductor 240 is made from a bimetallic alloy of 1% to 99% palladium or a bimetallic alloy of 1% to 99% lead and is arranged on a substrate to form sensing element 260 in a serpentine pattern (paragraphs 0026-0027). Kordecki also discloses that the corrosion sensor of a lead-palladium or lead-bismuth alloy of 5% to 95% lead and a complementary amount of palladium or bismuth is well-suited for corrosion sensors, and this percentage composition may be adjusted for its conductor 140 in order to achieve a certain resistivity and TCR (paragraph 0026). Kordecki also discloses a combination sensor 300, which incorporates the ideas of the above description for the abrasion and corrosion sensor (paragraphs 0028-0029). It would have been obvious to modify the modified Ansuini/Glass device to include the above elements taught by Kordecki in order to provide a multi-functional abrasion and corrosion sensor of the proper alloy compositions to achieve desirable resistivity and TCR.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansuini/Glass (5,437,773) in view of Glass (5,409,859). Ansuini/Glass (5,437,773) have been discussed above. Ansuini/Glass ('773) do not disclose annealing the thin film on to the substrate to encourage metallic grain growth. Glass ('859) discloses that the platinum layer may be annealed after it is deposited on the substrate (lines 45-56, col. 9, and contents). It would have been obvious to modify the modified Ansuini/Glass ('773) device to include annealing the deposited film to the substrate in order to strengthen the film and encourage metallic grain growth.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Peart (4,380,763) discloses a corrosion monitoring system that may be applied remotely to sense corrosion on aircrafts. Payne (4,306,127) discloses a corrosion sensor that performs a dual function of acting as a corrosion sensor and as a seal member for protecting the remainder of the structure from the corrosive area being monitored.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neil Turk whose telephone number is 571-272-8919. The examiner can normally be reached on Mon-Fri 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NT

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